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Application Number	10/035,344
Filing Date	January 4, 2002
First Named Inventor	Cimbora et al.
Art Unit	1647
Examiner Name	R. Landsman
Attorney Docket Number	1804.10

ENCLOSURES (check all that apply)

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment / Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
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- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
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  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
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- ☒ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Company Name	Myriad Genetics, Inc.		
Signature			
Printed name	Jonathan A. Baker, Ph.D.		
Date	August 16, 2006	Reg. No.	49,022

CERTIFICATE OF EXPRESS MAIL

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated below and is addressed to: Mail Stop Appeal Brief – Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450. Express Mail Label No. EV 495504024 US

Typed or printed name	Keri Morris		
Signature	Keri Morris	Date	August 16, 2006

Attorney Docket No. 1804.10 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Inventor(s): Cimbora et al.	)	
Application No.: 10/035,344	)	Group Art Unit: 1647
Filed: January 4, 2002	)	Examiner: R. Landsman
For: METHODS OF USING PROTEIN COMPLEXES IN DRUG SCREENING	)	

CERTIFICATE OF EXPRESS MAIL

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Keri Morris

August 16, 2006
Date

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby submit an amended Appeal Brief in response to the Office Action dated August 2, 2006.

It is believed that no extensions of time or fees are due with this response. If this is incorrect, Applicant hereby petitions for any necessary extension of time and the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. **50-1627.**

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26. Allegation (1) of point 20 is refuted by points 6-17 above which indicate there is considerable guidance regarding the structure and function of the claimed proteins.

27. Allegation (2) of point 20 is refuted by point 6-17 above which indicate common structural features of the claimed proteins.

28. In view of points 24-27 above, Applicants respectfully submit that the claimed invention is fully enabled and respectfully request that the Board reverses the Examiner's rejection.

CONCLUSION

Applicants respectfully request that the rejection of Claims 1, 46, and 48-50 under 35 USC § 112, first paragraph, for an alleged lack of enablement and an alleged lack of written description be reversed.

The Director was already authorized to charge the required Appeal Brief fee of $250.00, set forth in § 1.17(c), to Deposit Account No. **50-1627**, when the appeal brief was originally submitted on October 20, 2005. Provision for the payment of the necessary fee for the extension of time was also made and a petition for extension of time was requested with original submission on October 20, 2005. Therefore, it is believed that no other extension of time, nor any additional fees are due with this brief. If this is incorrect, an extension of time as deemed necessary is hereby requested, and the Commissioner is hereby authorized to charge any appropriate fees or credit any overpayment, to Deposit Account no. **50-1627**.

Respectfully submitted,

Jonathan A. Baker, Ph.D.
Agent for Applicants
Registration No. 49,022

Intellectual Property Department
Myriad Genetics, Inc.
(Customer No. 26698)
320 Wakara Way
Salt Lake City, UT 84108
Telephone: 801-584-3600

Date: August 16, 2006

(1) REAL PARTY IN INTEREST

The real party in interest is Myriad Genetics, Inc., a corporation of the State of Delaware, having a place of business at 320 Wakara Way, Salt Lake City, Utah 84108, to whom all interest in the present application has been assigned by virtue of an Assignment submitted on April 04, 2002, and recorded on June 4, 2002 (at reel 012757, and frame 0922).

(2) RELATED APPEALS AND INTERFERENCES

Appellants are not aware of any related appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board of Patent Appeals and Interferences' decision in the present appeal.

(3) STATUS OF CLAIMS

Claims 1, 46, and 48-50 are currently pending in the application. Claims 2-45, 47, and 51-116 are canceled. Claims 1, 46, and 48-50, were finally rejected in a Final Office Action mailed on April 20, 2005, are appealed, and are provided in the attached Appendix A.

(4) STATUS OF AMENDMENTS

A final rejection was issued in this case on April 20, 2005. According to this final rejection, the Amendment dated July 20, 2005 was entered into the record. No subsequent amendments have been provided. The present appeal is based on the pending claims as reproduced in Appendix A.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

Claims 1, 46, and 48-50 are drawn to protein complexes and methods of using the protein complexes for drug screening. Claim 1 is the only independent claim. Claim 1 relates to protein complexes composed of (1) AKT1 or fragments thereof (and homologues at least 90% identical thereto) and a protein chosen from FNTA, TPRD, KIAA0728, PPL, and Golgin-84, or fragments thereof (and homologues at least 90% identical thereto), or (2) AKT2 or fragments thereof (and homologues at least 90%

identical thereto) and a protein chosen from CLIC1, AKR7A2 and TPRD, or fragments thereof (and homologues at least 90% identical thereto). Support for the protein complex of claim 1 is found in the specification at page 2, lines 20-25; page 5 line 10 through page 7, line 6; page 18, lines 20-24; and page 23, table 11.

(6) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. The first issue is whether the examiner erred in rejecting claims 1, 46, and 48-50 based on the enablement requirement of 35 USC § 112, first paragraph.

2. The second issue is whether the examiner erred in rejecting Claims 1, 46, and 48-50 based on the written description requirement of 35 USC § 112, first paragraph.

(7) ARGUMENT

As is clear from the Issues section above, the pending claims stand finally rejected based on an alleged lack of enablement and an alleged lack of written description. These rejections, as applied in the Final Office Action, and Appellants' responses to these rejections are now presented.

I. Claim Rejections under 35 USC § 112, 1st paragraph – Enablement

1. Claims 1, 46, and 48-50 are finally rejected under 35 USC § 112, first paragraph for an alleged lack of enablement, on the basis of the examiner's finding of the specification not teaching how to use the complex. The Examiner has alleged three different bases for lack of enablement.

2. The first issue regarding enablement is whether the claimed protein complexes are enabled for homologues having at least 90% identity to the natural occurring protein (see e.g., office action dated 4/20/05, page 3, and advisory action dated 9/15/05, page 2). The Examiner first rejected these claims based on (1) the allegation that it is not predictable to one of ordinary skill in the art how to make a functional protein which is less than 100% identical to any one of the claimed proteins (see e.g.,

office action dated 4/20/05, page 3). The Examiner then later admits that the art taught that minor changes in AKT structure could be introduced while still retaining function, yet states that the grounds of the rejection are based on the fact that the art has not shown that 10% of AKT can be altered while retaining function (see e.g., advisory action dated 9/15/05, page 2).

3. The second issue regarding enablement is that the Examiner also alleges that the other proteins covered by the claims have no known structure-function relationships.

4. The third issue regarding enablement is that the Examiner alleges that although the Applicants have identified a protein-protein binding pairs, it is not clear how to use these complexes.

5. Enablement is a legal determination of whether a patent enables one skilled in the art to make and use the claimed invention without undue experimentation. Ratheon Co. v. Roper Corp., 724 F.2d 951, 960, 220 USPQ 592, 599 (Fed. Cir. 1983); In re Vaeck, 947 F.2d 488, 495, 20 USPQ2d 1438, 1444 (Fed. Cir. 1991). Enablement is not precluded even if some experimentation is necessary, although the amount of experimentation needed must not be unduly extensive. Atlas Powder Co. v. E.I. Du Pont De Nemours & Co., 750 F.2d 1540, 1555, 220 USPQ 303, 315 (Fed. Cir. 1983). In order to establish a prima facie case of lack of enablement, the examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. See In re Wright, 999 F.2d 1557, 1561-62, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993). That is, the examiner must provide **a reasonable explanation** as to why the scope of protection provided by a claim is not adequately enabled by the disclosure. See id.

6. Bascom et al. (1999), of record as reference B13 in the IDS submitted 2/12/03, discloses the structure and function of Golgin-84 (see e.g., FIG. 2, page 2955, and page 2956, column 2, through page 2958, column 2).

7. Qian et al. (1999), of record as reference B12 in the IDS submitted 2/12/03, disclose the structure of CLIC1, CLIC2, and CLIC3 (page 1623, figure 1(B)). Qian et al. identify homologous regions between the three evolutionarily conserved proteins (page 1623, figure 1(B)). Qian et al. teach that CLIC1 has a nuclear localization signal (page 1626, column 2, first full paragraph).

8. Aho et al. (1998), of record as reference B11 in the IDS submitted 2/12/03, discloses the structure of human and mouse PPL (page 242, footnote indicating GenBank accession numbers) Aho et al. disclose structural homology of PPL with other known proteins (page 243, column 2). Aho et al. disclose structural/function relationships in members of the PPL protein family (page 242, column 2).

9. Valenzuela et al. (1997), of record as reference B10 in the IDS submitted 2/12/03, disclose the structure of CLIC1 (page 12578, Figure 1(A)) with identification of a nuclear localization signal and two transmembrane domains. Valenzuela et al. identify N-glycosylation sites, a cAMP phosphorylation site, protein kinase C phosphorylation sites, and 5 N-myristoylation sites (page 12578, columns 1-2). Valenzuela discloses evidence consistent with an ion channel function for CLIC1 (page 12581, columns 1-2).

10. Ventura et al. (1996), of record as reference B7 in the IDS submitted 2/12/03, discloses that FNTA interacts with TBR-1 (FIG. 1, page 12932). Ventura discloses that FNTA interacts with ActR-IB which has 90% identity to TβR-I (page 12932, paragraph bridging columns 1 and 2).

11. Wang et al. (1996), of record as reference B16 in the IDS submitted 2/12/03, disclose the structure and function of FNTA (see e.g., page 1120, column). Ventura et al. disclose the interaction of FNTA with R4C (see entire paper).

12. Ohira et al. (1996), of record as reference B5 in the IDS submitted 2/12/03, discloses the structure of TPRD (see e.g., FIG. 2(a), pages 12-13). Ohira et al. discloses a multiple sequence alignment of the TPR motif of TPRD with 5 other TPR motifs (see e.g., FIG. 2(a), page 13). Ohira et al. disclose the structural and functional information regarding TPRD (see e.g., pages 14-15).

13. Tsukahara et al. (1996), of record as reference B4 in the IDS submitted 2/12/03, discloses the structure of TPRD (see e.g., FIG. 1, pages 821-822). Tsukahara et al. disclose the structure of TPRD in relation to two other homologs (see e.g., FIG. 2, page 824). Tsukahara et al. disclose structure/function information regarding TPRD (see e.g., page 826, column 1).

14. Paragraph [0019] of the specification discloses the function of AKT1 and AKT2, and cites numerous literature references.

15. Paragraphs [0022]-[0028] of the specification disclose structural and functional information regarding the claimed proteins.

16. Points 6-15 indicate that structural and functional information regarding the proteins in the claimed protein complexes were known to the skilled artisan at the time of filing.

17. Points 6-13 indicate that the ordinary skilled artisan at the time of filing of this application was capable of identifying conserved residues between homologous protein sequences to decipher the function of specific amino acid residues. Points 6-13 also indicate the skilled artisan at the time of filing of this application was capable of identifying various functional domains and sequence motifs of the claimed proteins.

18. The Examiner's proffered evidence to support an alleged lack of enablement consists of the following allegations: (1) that "Though the art may show minor changes to AKT, the art has not shown that 10% of AKT1 can be altered why retaining function"; (2) "Even, arguendo, AKT structure was known and it was known which residues could be altered to retain the functional characteristics of AKT1, the claims are drawn to AKT2 as well as other proteins. Therefore, it is not known which residues can be altered to retain function"; and (3) "Furthermore, though Applicants may have identified that these binding pairs occur, it is not clear how to use these proteins." See advisory action dated 9/15/05, page 2, and office action dated 4/20/05, pages 2-3.

19. Allegation (1) of point 19 is refuted by Applicants own specification which indicates that more than 10% of AKT1 can be altered while retaining function. See Table 11 on page 23 of the specification which indicates that AKT1 fragments having 151 amino acids, 109 amino acids, and 118 amino acids can interact with various proteins. The AKT1 fragment having 109 amino acids differs from the AKT having 151 amino acids by about 28%. The AKT2 fragment having 108 amino acids differs from the AKT2 fragment having 152 amino acids by about 29%. The TPRD fragment having 131 amino acids differs from the full-length TPRD having 6077 amino acids by about 98%. The KIAA0728 fragment having 215 amino acids differs from the full-length KIAA0728 having 1638 amino acids by about 87%. The PPL fragment having 208 amino acids differs from the full-length PPL having 1156 amino acids by about82%. The Golgin-84 fragment having 122 amino acids differs from the full-length Golgin-84

having 732 amino acids by about 83%. The CLIC1 fragment having 242 amino acids differs from the full-length CLIC1 having 159 amino acids by about 36%. The AKR7A2 fragment having 248 amino acids differs from the full-length AKR7A2 having 330 amino acids by about 25%.

20. Allegation (2) of point 17 is refuted by points 6-17 which indicate that there are numerous teachings regarding the structure and function of the claimed proteins.

21. Allegation (3) of point 17 is refuted by points 6-17 which indicate that the skilled artisan has considerable knowledge regarding the functions of the claimed proteins and would therefore know how to use the claimed protein complexes.

22. Allegation (3) of point 17 is also refuted by the Examiner's statement in the office action dated 4/20/05 (page 2) relating that "The rejection of claims 1, 46, and 48-50 under 35 USC 101 has been withdraw in view of Applicants' arguments that AKT1 and AKT2 are involved in cell proliferation and apoptosis and that the claimed complexes can be used as therapeutic targets for such events."

23. In view of the points 1-22 above, Applicants respectfully submit that the examiner has not provided a reasonable explanation as to why the claims are not enabled. Applicants respectfully submit the claimed invention is fully enabled and respectfully request that the Board reverses the Examiner's rejection.

II. Claim Rejections under 35 USC § 112, 1st paragraph – Written Description

24. The Examiner has rejected Claims 1, 46, and 48-50 under 35 USC § 112, first paragraph for an alleged lack of written description on the basis of the Examiner's finding of the specification not teaching how to use the complex. The Examiner's proffered evidence to support an alleged lack of consists of the allegations that (1) the written description issues are similar to the enablement (see e.g., advisory action dated 9/15/05, page 2) and (2) the specification does not indicate what structural attributes are shared by the members of the genus (see e.g., office action dated 4/20/05, page 3).

25. The record indicates considerable knowledge regarding the structure and function of the claimed proteins (see points 6-16 above).

APPENDIX A

Claims Under Appeal

Claim 1: An isolated protein complex comprising two proteins, the protein complex selected from the group consisting of:

(i) a complex of a first protein and a second protein;

(ii) a complex of a fragment of said first protein and said second protein;

(iii) a complex of said first protein and a fragment of said second protein; and

(iv) a complex of a fragment of said first protein and a fragment of said second protein, wherein said first and second proteins of (i)-(iv) are selected from the group consisting of:

(a) said first protein is AKT1 or a homologue at least 90% identical thereto and said second protein is selected from the group consisting of FNTA, TPRD, KIAA0728, PPL and Golgin-84, or a homologue at least 90% identical thereto; and

(b) said first protein is AKT2 or a homologue at least 90% identical thereto and said second protein is selected from the group consisting of CLIC1, AKR7A2 and TPRD or a homologue at least 90% identical thereto.

Claim 46: A method for screening for drug candidates capable of modulating the interaction of the proteins of a protein complex, the protein complex selected from the group consisting of the protein complexes of claim 1, said method comprising:

(i) combining the proteins of said protein complex in the presence of a drug to form a first complex;

(ii) combining the proteins in the absence of said drug to form a second complex;

(iii) measuring the amount of said first complex and said second complex; and

(iv) comparing the amount of said first complex with the amount of said second complex, wherein if the amount of said first complex is greater than, or less than the amount of said second complex, then the drug is a drug candidate for modulating the interaction of the proteins of said protein complex.

Claim 48: The method of claim 46, wherein said complex is measured by binding with an antibody specific for said protein complexes.

Claim 49: The method of claim 46, wherein if the amount of said first complex is greater than the amount of said second complex, then said drug is a drug candidate for promoting the interaction of said proteins.

Claim 50: The method of claim 46, wherein if the amount of said first complex is less than the amount of said second complex, then said drug is a drug candidate for inhibiting the interaction of said proteins.

APPENDIX B

Evidence Appendix

The Applicants are not aware of any additional evidence that should be in this appendix according to 37 CFR § 41.37(c)(ix).

APPENDIX C

Related Proceedings Appendix

The Applicants are not aware of any additional related proceedings or decisions that should be in this appendix according to 37 CFR § 41.37(c)(x).